

establishment of a permanent International Commission for Electrical Standards. Pending the appointment of this commission, Lord Rayleigh nominated a scientific committee of fifteen to advise as to the organisation of the commission and to formulate a plan to direct such work as may be necessary in connection with electrical standards all over the world. In order to facilitate this work, various standardising laboratories will be asked to cooperate with the commission, and to carry out, if possible, such work as it may desire. The question was discussed of enlarging the functions of the International Conference on Weights and Measures, so as to combine with it in future electrical conferences, and the opinion of the conference was favourable to such a combination.

It is hoped that the scientific committee will from time to time modify the notes accompanying the specifications as may be necessary, and that this will conduce to greater uniformity between the standards of the various countries.

ANTHROPOLOGY AT THE BRITISH ASSOCIATION.

THE meeting of the anthropological section of the British Association was amongst the most successful that has been held in recent years. The address of the president, Prof. Ridgeway, which has been reported in full in NATURE, has already led to considerable discussion and promises to have a good effect, and the meeting, so happily inaugurated, has been fruitful of much good work. As has been noticeable for some time past, papers upon archaeological subjects were by far the most numerous. It is to be regretted that the communications in physical anthropology, although of exceptional interest, were hardly so numerous as those interested in the welfare of the section would wish to see. It is to be feared that there is a tendency among physical anthropologists to submit the results of their work to bodies other than the association—a matter for regret in view both of the importance of this branch of the study of man and of the interest in the subject taken by the ordinary members of the association, as shown by the size of the audience usually attracted by such papers.

The papers on physical anthropology included an important communication by Prof. Symington, on certain changes in the lateral wall of the cranium due to muscular development. Observations were made upon the relation of the temporal muscle to the skull and brain from birth until adult life, and it was demonstrated that at birth the muscle was small compared with the brain case, and that consequently the temporal ridge was low at this period of life. After birth the muscle grows more rapidly than the lateral area of the skull, and gradually extends upon it, so that the temporal ridge reaches a much higher level than in the infant. This extension proceeds gradually, and is associated with that of the jaws and teeth, being independent of that of the brain.

In his paper on the significance of the so-called accessory dental masses sometimes found in the upper jaw-bones, Prof. Francis Dixon, from an examination of a series of young Ibo skulls, came to the conclusion that these masses do not represent the rudiments of aborted or vestigial molars, corresponding to the third premolars of the platyrrhine apes, but arise as unabsorbed portions of the second milk molar. It is an interesting question why these fragments are so frequently retained in certain races.

An important contribution to our knowledge of the Egyptian races was made by Prof. Elliot Smith in his paper on anthropological work in Egypt. In his opinion the present population is remarkably uniform, the range of variation being not appreciably greater than that of any other known race. The infusion of negro blood is very small in amount, and its effect is usually slighter than is commonly supposed to be the case. The negro influence is least marked in pre-dynastic times. In Nubia, which was always open to raids from the south, there is a much more marked negro element, and the population of this district may be said to be a hybrid one. There is also evidence of a Levantine element in the Delta as early as the time of the Pyramid builders. The Copts show the

least resemblance to the ancient Egyptians, owing to inter-marriage with immigrants of their own faith.

Other physical papers were one on the adult brain, by Prof. A. Fraser; the report of the Cretan Committee, which published a preliminary statement on Mr. Hawes's examination of the crania; and that of the Anthropometric Committee, which published a report giving the result of its deliberations for the last seven years.

Another paper, by Prof. Elliot Smith, on the history of mummification in Egypt, may be mentioned here. After showing how in pre-dynastic times the custom of burying bodies in the sand led to their preservation, the author suggested that the idea of preserving their dead by art must have occurred to the Egyptians by observing this phenomenon, more especially as the later custom of burying in coffins or rock-cut chambers led to the bodies' dissolution. The desire was, of course, prompted by religious beliefs. When exactly embalming was first attempted there were no data to show. Although the earliest bodies known to have been embalmed are of the tenth dynasty, there is some evidence to show that the custom was practised by the Pyramid builders. The process of mummification reached its highest development under the New Empire, although under the Middle Empire the general technique was that which was followed for the succeeding two thousand years. Further stages in the art were followed by a period of rapid decline.

An important paper on Rajputs and Mahrattas was contributed by Mr. Crooke, who criticised the views of Sir Herbert Risley on the origin of these peoples. On the evidence of anthropometry, the Rajputs have been classed as Indo-Aryans, but the evidence rather points to the conclusion that they are a status group, compounded from varied elements, and not an ethnical unit. The Mahrattas similarly are a status group, the basis being the Dravidian or indigenous Kunbi tribe. It was suggested that the uniformity which characterises the physical character of the peoples of the Punjab might be due to sexual selection and the influence of environment, which have to some extent been overlooked by ethnologists.

Dr. C. G. Seligmann gave an account of his recent expedition to the Veddas of Ceylon, who may be divided into three divisions, Veddas, village Veddas, and coast Veddas, characterised by different sociological features. The coast Veddas have borrowed largely from the Tamils, and the village Veddas have intermarried with the Sinhalese, but in spite of this the clan organisation of the wild Veddas largely remains. There is hardly any decorative art. Their cult of the dead has given rise to pantomimic dances, which are performed chiefly by men trained to invoke the spirits. In language the Veddas speak Sinhalese or Sinhalese dialects with the addition of a few words not obviously Sinhalese.

A collection of Dinka laws, made by Captain O'Sullivan, was read by Mr. E. Sidney Hartland. The Dinka government is patriarchal with male descent. An interesting custom is the legal fiction by which an heir is provided when the male line has died out.

The archaeological papers were of a very varied character, but naturally a considerable part of the section's work consisted in discussing Irish antiquities, and here the section was at the advantage of meeting next door to the National Museum where the Irish collections are displayed, and Mr. Coffey and Mr. Armstrong, the keeper and chief assistant of the Department of Irish Antiquities, were assiduous in their efforts in showing members the magnificent collections which are in their charge. The section, moreover, was fortunate in hearing papers from both these gentlemen on subjects which they have made their own.

Thus Mr. Coffey presented three papers. The first, on the distribution of the gold *lunulae*, showed that whereas in Ireland sixty of these characteristic Irish ornaments had been found, only eighteen had been discovered in Great Britain and the rest of western Europe. This distribution points either to early raids on Ireland from the Continent or to an early trade for gold. The *lunulae* may be dated between 1200 B.C. and 1500 B.C. Another paper by Mr. Coffey was on the survival of La Tène ornament on some Celtic penannular brooches. These brooches may be safely dated at not later than 700 A.D., as there is a complete

absence of any interlaced ornament on them, and many La Tène elements survive in their decoration, some may even be earlier. They are all of bronze, but the enamels on them have disappeared. Finally, Mr. Coffey contributed a note on the Tara brooch which directed attention to a fact hitherto unobserved, namely, that the fine wires of the interlaced patterns, of the central interlacings and of the head of the pin have a minute granulation, which is not apparent to the naked eye.

Mr. Armstrong's paper directed attention to the recent discovery of a leather shield in co. Longford. The shield is made of a solid piece of leather about 20 inches in length and 19 inches across, and has an oblong central boss, which has been pressed out of the leather and furnished with a cap, composed of finer leather, laced on to the boss. The face of the shield is ornamented with three ribs, between which are small bosses arranged in sets of three, the decoration recalling that of the bronze shields. The back of the shield is furnished with a handle. That the specimen is not the leather lining of a bronze shield is clear from the thickness of the leather and the lacing of the boss. It is of the same type as the bronze shields of Western and Upper Europe.

The subject of earthworks was dealt with by Mr. Goddard Orpen in a paper on the origin of Irish mottes, which he referred, on documentary and geographical evidence, not to the Celtic or Scandinavian invaders, but to the Normans, thus bringing the date of their erection down to the eleventh century A.D.

Another paper of considerable interest was Dr. Scharff's, on the Irish horse and its early history. The most complete remains of the horse found in Ireland were discovered in the Craigywarren Crannog, in Antrim. The occupation of this crannog dates back to early Christian times, and the horses were doubtless domesticated. These remains bore as striking a resemblance to the Arab type as does the modern Connemara pony. Other remains found indicate that at a more remote period a small race of horse, similar to those found in the Crannog, lived in Ireland, some of which remains probably belonged to a wild breed. It seems clear that the resemblance of the Connemara pony to the eastern and Libyan horse is not entirely due to human introduction of foreign stock, but to the fact that the wild horse of Ireland possessed the same characteristics, which it transmitted to the existing ancient domestic breeds.

In British prehistoric archaeology several important papers were submitted. Miss Layard, whose work on the Ipswich Palæolithic site is well known, directed attention to an ancient land surface in that district, where flint implements have been discovered in association with bones of horse, deer, mammoth, *Bos primigenius*, wolf, and bear. The remains were 30 feet below the present surface. She also directed attention to a new Palæolithic site in the valley of the Lark, where rough palæoliths and a large number of flint cores have been found.

Mr. J. Gray, in a paper on Who built the British stone circles? reported the discovery of the remains of a unique race recently discovered associated with short cists in Aberdeenshire. This race, which is of the early Bronze age, is different from any other known prehistoric race in Britain, Sweden, Denmark, and Switzerland, but there are indications of affinity with the ancient peoples of south-west Asia.

In a paper on cup and ring markings, the Rev. H. J. Dukinfield Astley sought to connect these markings with the designs on the churinga of the Arunta, and suggested that they were totemistic.

A paper by Mr. G. Clinch, suggesting a system of classification of Megalithic remains, and the report of the committee appointed to consider this subject, led to an interesting discussion, in which the president, Mr. Acland, and Mr. Swift MacNeill took part. The general consensus of opinion was that the preservation of ancient monuments should be made compulsory and not merely permissive, and that the inspector of ancient monuments should be an active official with wide powers. It was further suggested that a short private Bill might be introduced into Parliament.

The report of the Glastonbury Lake Village Committee directed attention to the discovery of two other villages at

Meare, on which tentative excavations had been made with promising results, while that on the age of stone circles reported that excavations had been begun on the ditch at Avebury, in which were discovered a good stratification of pottery, from Mediæval to Bronze-age types, and deer-horn picks, recalling those of Grime's Graves and Cissbury. These relics tend to confirm the theory that the Avebury circle is of the Neolithic or early Bronze-age period, but this can hardly be said to be proved by the present excavation.

Roman remains in Britain again occupied a considerable part of the section's proceedings. Dr. Ashby again gave an account of the excavations at Caerwent which have resulted in the exploration of the basilica and forum, which corresponds closely to that at Silchester. Dr. Newstead described the portion of Roman wall recently found at Chester. It is of ashlar, backed by rubble, with a solid bank of stiff clayey loam behind. The fosse was also excavated in two places. It was not of the usual V-shape, but was broad at the bottom. The finds were numerous; including portions of pottery, fragments of tiles, bones of animals, and coins. A fine flint axe of Palæolithic type was also discovered, as well as the remains of a quern and some spindle whorls.

Prof. J. L. Myres gave a general account of the work of the Liverpool Committee for Excavation and Research in Wales and the Marches. The last season has been occupied with a preliminary survey of a few districts of Wales, and with tentative excavations on sites which seem likely to deserve more thorough examination. Such was the excavation at Caerleon, an account of which was presented by Mr. H. G. Evelyn White. Its chief importance lay in the recovery of the ground plan of the interior arrangements of the camp.

As is usual, many papers dealing with non-British archaeology were presented. Among these, one of the most interesting was Mr. J. P. Droop's, on Neolithic culture in north Greece. One of these Neolithic settlements can be roughly dated to 1300 B.C. by the presence of Mycenaean sherds. Subsequently there was a poor Bronze period. The discovery is therefore of the utmost importance, as it shows that, while the bronze culture of the Aegean was being developed, peoples in the north of Greece were still in the Stone age and used bronze comparatively late, and then, presumably, only for a short period before the introduction of iron.

The excavations on the site of the sanctuary of Artemis Orthia at Sparta were described by Mr. M. S. Thompson. The chief find of the year was the remains of a primitive temple of a date contemporary with the great archaic altar. It seems clear that this had a gable roof with a row of pillars supporting the roof tree, similar to the temple of Thermos in Aetolia. In this primitive building may be seen the earliest Dorian style. Many votive offerings were found on the site, as well as a further number of the terra-cotta masks. The so-called Cyrenaic pottery has been proved to be Laconian, as had already been suggested.

An account of the four principal aqueducts of the city of Rome was given by Dr. T. Ashby. Considerable remains of these conduits still exist. Their course between Gallicano and a point seven miles from Rome, where they run upon arches into the city, has hitherto been treated as unknown, but has now been determined accurately, chiefly by making a search for the pieces of calcareous deposit brought down by the water, which was removed from the channels when they were cleaned. Dr. Ashby also gave an account of the work carried out in Sardinia by Dr. Mackenzie and himself. Their researches were devoted to determining the relations between the nuraghi and the so-called tombs of the giants—the latter consisting of long chambers with a circular area, enclosed by upright slabs or by walling in front of them. It seemed clear that the two were in very close relation, the former being the fortified habitation and the latter the family tomb.

The section was peculiarly fortunate in having a paper presented by Dr. Haakon Schetelig, the director of the Bergen Museum. Dr. Schetelig took as his subject the sculptured stones of Norway and their relations to some British monuments. The symbols on these monuments,

for example, the comb, serpent, crescent, and radiated sun-disc, are also found on the early Christian monuments of Scotland, and seem to point to direct communication between Scotland and western Europe about 700 A.D. A sculptured stone from Tu, in Jaederen, with a runic inscription of the peculiar character found on the Norwegian crosses in the Isle of Man, possibly points to an influence from that island.

On non-European archaeology four papers were presented. Mr. C. T. Currelly, in a sequence of Egyptian stone implements, considered that the development of the Thebaid palaeoliths could be traced from the depth of the patina and from the scratchings. The Neolithic implements of the Thebaid, on the other hand, show little patination, though the length of the Neolithic period may be traced from the fact that unpatinated neoliths have been made by re-working patinated ones.

The Rev. W. A. Adams, in a paper on some ancient stone implement sites in South Africa, recorded the discovery of implements of Palaeolithic type from five districts, the hill slope near Bosman's Crossing, Stellenbosch, the Karoo and the Vaal River terraces, near Kimberley, the Rhodesian uplands near Bulawayo, and the headlands of the Victoria Falls.

An interesting paper on prehistoric archaeology in Japan was presented by Dr. Gordon Munro, in which considerable light was thrown on the question of the immigrations to the country from the mainland. Many Japanese archaeologists deny the fact that the primitive inhabitants of Japan were of the same stock as the existing Ainu, but the discovery of Ainu remains in the shell-heaps proves that this people played a part in the Neolithic culture, and the excavations have revealed a connection between the pottery of this phase and that of the iron culture which accompanied the agricultural invaders from Asia. The progress of these invaders towards the east and north was slow, and may have begun about five centuries B.C., or even earlier. No undoubted Palaeolithic remains were found, but the resemblance of the culture to that of other lands agrees with the general verdict of prehistoric intercommunication.

Finally, the Rev. Dr. Bryce, of Winnipeg, read a paper on the mound builders of North America, which was of peculiar interest in view of the association meeting in Winnipeg next year. An examination of a large number of these mounds led the author to conclude that they were built by the Toltecs, and that they mark the course of a Toltec immigration from the south along the Mississippi and Ohio to the Great Lakes and the St. Lawrence; along the Missouri; and along the Mississippi proper to the Rainy and Red rivers. This would make the earliest mound date from about 1100 A.D.

In conclusion, it should be mentioned that the success which attended the meeting was in a very great measure due to the kindness and energy of Mr. Laurence Steele, the section's local secretary.

LOCAL SCIENTIFIC SOCIETIES AT THE BRITISH ASSOCIATION.

DURING the Dublin meeting of the British Association the conference of delegates held two meetings under the chairmanship of Prof. H. A. Miers, F.R.S. At the opening meeting, held on September 3, the chairman read an address on the educational opportunities of local scientific societies. In this he reviewed the growth of such bodies, some of which dated back nearly a hundred years. In these cases they did pioneer work, and helped to create a general scientific atmosphere. With the birth of the British Association, which, he said, might be regarded as a magnified society of the same character changing its yearly habitat, a great stimulus was supplied, as at that time scientific work was supplemented in a very inadequate manner by the publishers and the Press. After this date the growth of local scientific societies and cheap elementary text-books, which stimulated a desire for sound knowledge, was very rapid. Gradually, however, the early manuals, containing perhaps a whole science, have been supplanted by the educational text-book used in schools and the specialist treatise for the advanced student. Thus the amateur nowadays is

almost in danger of being placed in the position of his predecessor of sixty-five years ago. He has no time to go through a course of special reading in text-books of various grades, and without that, although perhaps quite learned in one branch of science, can get no adequate insight into modern advances through needless technicalities and their expression in a language which he cannot understand.

The same is the case with the greater scientific societies—they are becoming every day more highly specialised, both in their publications and in their membership. Here is the opening for the local scientific society, but only if it really attempts to meet the wants of the intelligent amateur. It is all very well to make arrangements for sections to take up the local flora and fauna, but what is wanted in addition is some common ground by which all the members can be united by their general interest in science, combined with some educational help to those to whom science is chiefly a hobby and a relaxation. One of the most useful functions of a body like a local society is to encourage a habit of expressing scientific result in simple and intelligible language that will appeal to the whole society. Indeed, nothing can be better or more useful for the scientific specialist himself than to attempt to explain his own work in simple language to a mixed audience. The set lecture is not so much needed, but the description by a speaker of what he has done or seen himself. In a local society no better material for educational improvement should exist where the members have joined it voluntarily, and, in the first instance, because they really wished to learn. In addition to this nothing is more wanted at the present day than books giving simple, untechnical accounts of the living work by the worker himself, and this should be done, not only in the newest fields of science, the popularisation of which is liable to be overdone, but in the more ordinary work of everyday science, which results in discoveries perhaps equally momentous, but at present buried beyond the reach of the amateur.

The educational work that the local societies can best perform through its members, who, though not children, have unprepared minds, is the encouragement of original research. This could be done, first, by inviting the trained and experienced workers to make known to them, through the medium of untechnical language, the beauty and interest of scientific work in the course of its progress, and of scientific discovery in the making; and, secondly, by providing them with followers who will continue to prosecute under their guidance original observation and even experimental research. Enthusiasm has been instilled and sincere students produced by the university extension movements; let the local societies initiate a new science extension movement by which the barrier between the professional man of science and the amateur, between the expert and the layman, will be broken down.

After discussion and votes of thanks, Sir Edward Brabrook proposed that "the conference desires to represent to the committee of recommendations that whenever a committee of the British Association enters upon a local investigation, notice should be given to any local scientific or archaeological society so as to enable that society to offer any cooperation that may be desirable." This, having been seconded by the Rev. J. O. Bevan, was carried unanimously.

Mrs. Mary Hobson then read a paper on sanctuaries for our native flora and fauna, in which she discussed various schemes for obtaining, or getting public bodies to set aside, waste land as sanctuaries, instancing that in Ireland already such places existed as Lambay Island, protected by the Hon. Cecil Baring; at Glencar, co. Sligo, on land owned by the Wynne family; at Knocknarae Glen, in the same county, where the hartstongue ferns have the longest fronds in Britain, upwards of a yard in length; and, finally, at Clonbrock Forest, in Galway, where Lord Clonbrock has a sanctuary which has been undisturbed since Elizabethan times. She also adverted especially on the destructive spirit of collecting rare birds and chance migrants, not to speak of other things. That was not the way to advance knowledge, which was, however, fostered by the study of birds in their native haunts.